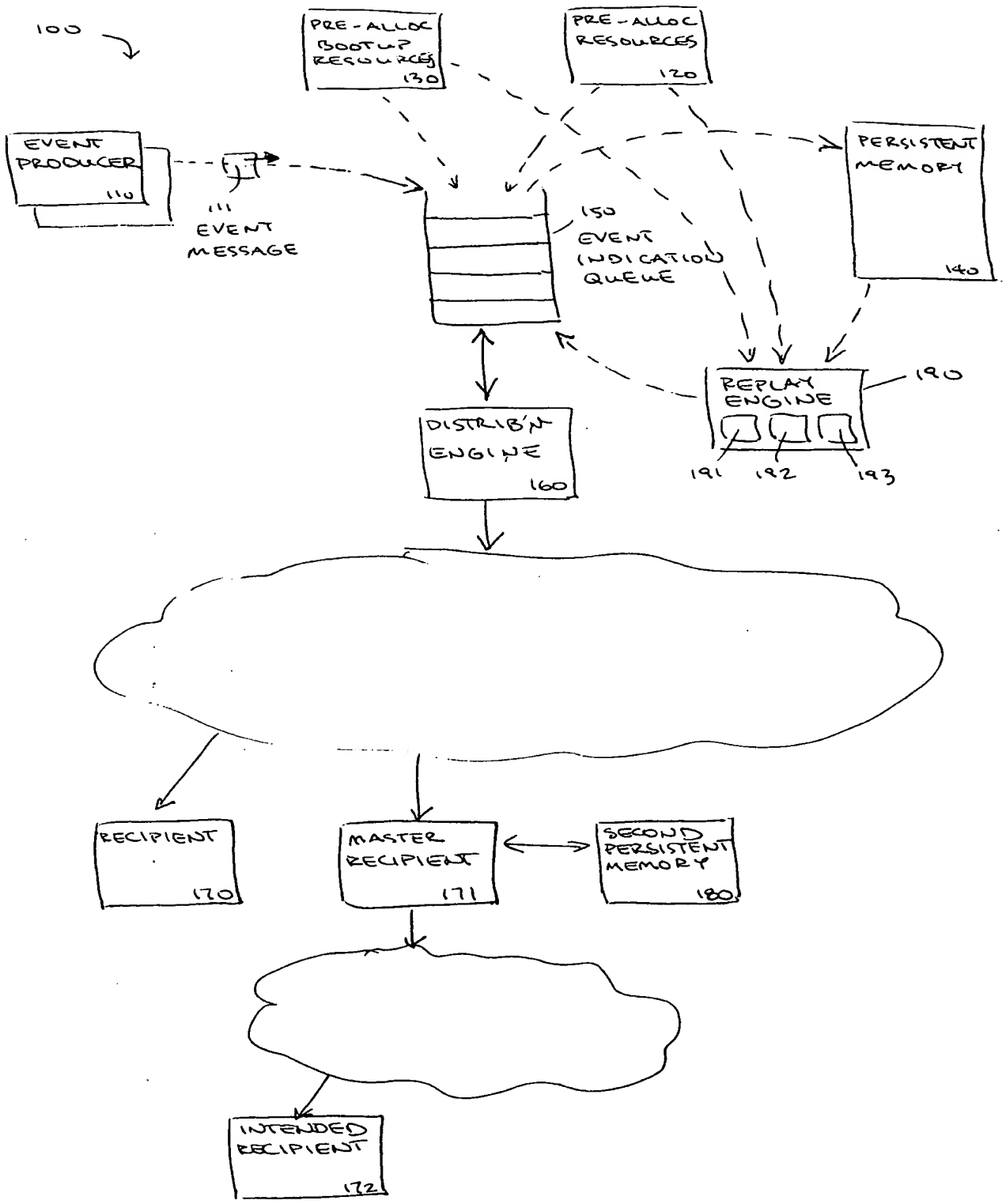

103-1048-01
FIGURE 1.
SHEET 1 of 4

1. Processing Event Messages

210
The system 100 is ready to receive an event message 111.

↓

211
An event producer 110 generates an event message 111.

↓

212
If the system 100 is in normal operation, the event message 111 is recorded in the pre-allocated initialization event message resources 120. If the system 100 is still in its initialization time duration, the event message 111 is recorded in the pre-allocated post-initialization event message resources 130.

↓

213
The system 100 copies information about the event message 111 to a set of locations in the persistent memory 140.

↓

214
The system 100 copies information about the event message 111 to the event indication queue 150. In a preferred embodiment, the event indication queue 150 includes a FIFO similar to that maintained in the persistent memory 140.

↓

215
The event distribution engine 160 responds to the information about the event message 111 in the event indication queue 150. The event distribution engine 160 delivers the event message 111 to its intended recipients 172.

↓

216
The event distribution engine 160 awaits confirmation from each intended recipient 172 that the event message 111 was received by that particular intended recipient 172. When the event distribution engine 160 receives confirmation from all intended recipients 172, the method proceeds with the next step.

↓

217
The event distribution engine 160 removes the information about the event message 111 from the event indication queue 150 and from the persistent memory 140.

↓

220
The system 100 has completely processed the event message 111.

2. Replaying Event Messages

230
The system 100 has recovered from a system crash or a system error.

↓

to Fig 2B

from Fig 2A

231
The event replay engine 190 reads information about event messages 111 from the persistent memory 140.

231(a)
The system initialization replay sub-element 191 reads information about event messages 111 associated with the pre-allocated post-initialization event message resources 130. The event replay engine 190 replays these event messages 111.

231(b)
The incomplete event distribution replay sub-element 192 reads information about event messages 111 associated with the pre-allocated initialization event message resources 120. The event replay engine 190 replays these event messages 111 next.

231(c)
The cooperating systems replay sub-element 193 reads information about event messages 111, from the persistent memory 140, associated with and stored there by a cooperating system 100.

240
The system 100 has replayed all event messages 111 not yet fully processed, and is ready to proceed at the flow point 210.

3. *Multiplexing Recipient Operation*

250
A multiplexing recipient 171 is ready to receive an event message 111.

251
The multiplexing recipient 171 receives the event message 111 from the event distribution engine 160.

252
The multiplexing recipient 171 records information about the event message 111 in its second persistent memory 180.

253
The multiplexing recipient 171 (optionally) responds to the event message 111 by confirming that it was received at the multiplexing recipient 171 (but not necessarily at the intended recipients 172).

254
The multiplexing recipient 171 (optionally) determines to which intended recipients 172 to deliver the event message 111.

255
The multiplexing recipient 171 awaits confirmation from each particular intended recipient 172 that the particular intended recipient 172 has received the event message 111.

to Fig 2C

From 2B

256
The multiplexing recipient 171 receives such confirmation from individual intended recipients 172.

260
The multiplexing recipient 171 has completely processed the event message 111.

4. Replaying Multiplexed Event Messages

270
The multiplexing recipient 171 has recovered from a system crash or a system error.

271
The multiplexing recipient 171 reads information about event messages 111 from the second persistent memory 180.

272
The multiplexing recipient 171 replays the event messages 111 from the second persistent memory 180.

280
The multiplexing recipient 171 has replayed all event messages 111 not yet fully processed, and is ready to proceed at the flow point 250.

5. Confirming Event Messages

290
The intended recipient 172 is ready to receive an event message 111.

291
The intended recipient 172 receives an event message 111.

292
The intended recipient 172 parses the event message 111 and processes the event message 111 according to its own (internal) processing rules for that event message 111.

293
The intended recipient 172 generates a confirmation message and sends that confirmation message to the sender of the event message 111.

300
The intended recipient 172 has received, processed, and confirmed the event message 111. The sender of the event message 111, upon receipt of the confirmation message, can regard the event message 111 as completely handled and can safely delete it.